

The Impending Sea Otter Crisis in Washington: Ecological Effects and Political Implications.

Glenn R. VanBlaricom

*Washington Cooperative Fish and Wildlife Research Unit
School of Aquatic and Fishery Sciences, University of Washington*

Sarah K. Carter

Wisconsin Department of Natural Resources

Leah R. Gerber

*National Center for Ecological Analysis and Synthesis
University of California, Santa Barbara*

Extended abstract

Sea otters (*Enhydra lutris*) were hunted to extinction in Washington's coastal waters early in the 20th century (Kenyon 1969). Sea otters were restored to the Washington coast in 1969 and 1970 by translocation of a group of animals from Alaska (Jameson and others 1982, 1986). The translocated population remained small through the 1970s, but since the early 1980s has grown significantly (Jameson 1998). Currently the sea otter range in Washington is from Kalaloch to Cape Flattery. The population numbers about 600 individuals and is growing more than 10% per year (Jameson and Jeffries 1999, Biological Resources Division, US Geological Survey, unpublished data). Since 1995 the population has been expanding eastward into the Strait of Juan de Fuca during winters. During winter 2001 sea otters were seen as far east as Pillar Point, several kilometers east of Sekiu. Reliable recent extralimital sightings have been made at San Juan and Whidbey Islands, near Federal Way, off the Nisqually Delta, and in southern Puget Sound (unpublished observations verified by the School of Aquatic and Fishery Sciences of the University of Washington, the Washington Department of Fish and Wildlife, and the Cascadia Research Collective).

Sea otters are widely known for controlling populations of grazing invertebrates, thereby enhancing the diversity and productivity of coastal ecosystems, and for negative impacts on fisheries for sea urchins, Dungeness crabs, abalones, and clams. We reviewed data on likely interactions of sea otters and coastal ecosystems in the eastern Strait of Juan de Fuca (ESJDF) should the Washington sea otter population continue to expand as is currently anticipated. We find significant potential for negative effects on fisheries for Dungeness crabs, sea urchins, and hardshell clams. There is reason for concern about possible effects of sea otters on sea cucumber fisheries, but a definitive conclusion about likely effects is not possible. The recreational fishery for pinto abalones in Washington is currently closed because of excessive harvest. However, we anticipate little likelihood of recovery of harvestable abalone populations if sea otters continue to increase in number and range. Information on potential effects of sea otters on ESJDF shellfish fisheries is reviewed in detail by Gerber and VanBlaricom (1999).

Available data indicate little potential for enhancement of the biodiversity or productivity of ESJDF coastal ecosystems by an expanding sea otter population. Surveys of nearshore benthic habitats were done in SJDF between Kydaka Point and Port Angeles in 1997 (Carter and VanBlaricom 1998). The data suggest that a combination of frequent physical disturbance and relatively unstable substrata facilitate domination of benthic populations, particularly among the macroalgae, by ephemeral species, or by juveniles of long-lived species. The data also suggest that sea urchin populations already have been reduced substantially, probably by commercial urchin harvesters. We propose that the combination of high turnover in benthic organisms and exploitation of grazing invertebrates limits the potential for ecosystem change associated with a restored sea otter population in ESJDF. Thus it is unlikely that a return of sea otters to ESJDF will appreciably enhance ecosystem biodiversity or productivity, in the manner predicted by currently popular paradigms (e.g., Estes and Duggins 1995). An experimental field study in the San Juan Islands (Carter 1999) is consistent with our conclusions based on the data of Carter and VanBlaricom (1998). Sustained

experimental reduction of sea urchins to 1% of pretreatment densities for a two year period failed to produce a detectable increase in macroalgal populations, or in other components of local benthic communities. The results indicate that recruitment limitations in algae may be another regional characteristic that will limit positive effects of a growing sea otter population on coastal marine ecosystems in ESJDF.

Our results lead to predictions of important negative effects of sea otters on shellfish fisheries, but little enhancement of system productivity or biodiversity by sea otters. Thus, managers and policy makers must be cautious in applying data from other geographic regions to resource conservation issues associated with sea otters in Washington's marine waters, particularly in ESJDF. The growing sea otter population provides an urgent incentive for agencies to establish management goals and begin planning for implementation. The decision process will be contentious, will involve strongly expressed inputs from stakeholders with conflicting values, and will challenge the political skills and resolve of relevant authorities.

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